REMARKS

The Office Action dated May 13, 2005, has been received and reviewed.

Claims 1-39 and 41-67 are currently pending in the above-referenced application. Of these, claims 1-13, 17-26, 31-33, 37-39, and 42-44 have been considered and stand rejected. Claims 14-16, 27-30, 34-36, 41, and 45-67 have been withdrawn from consideration.

Reconsideration of the above-referenced application is respectfully requested.

Supplemental Information Disclosure Statement

Please note that a Supplemental Information Disclosure Statement was filed in the above-referenced application on January 27, 2004, but that the undersigned attorney has not yet received any indication that the references cited in the Supplemental Information Disclosure Statement have been considered in the above-referenced application. It is respectfully requested that the information cited on the PTO/SB/08A be made of record herein. For the sake of convenience, a second copy of the January 27, 2004, Supplemental Information Disclosure Statement, PTO/SB/08A with copy of cited references, and USPTO date-stamped postcard are enclosed herewith. It is respectfully requested that an initialed copy of the PTO/SB/08A evidencing consideration of the cited references be returned to the undersigned attorney.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-13, 17-26, 31-33, 37-39, and 42-44 stand rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both

be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Foster

Claims 1-10, 17, 19-26, 33, and 42-44 are under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in U.S. Patent 6,552,416 to Foster (hereinafter "Foster").

Foster teaches a variety of multichip modules that include tape 32, die attach paste 33, and inner-lead traces 20 between stacked dies 30 and 31. *See, e.g.,* FIG. 8; col. 4, lines 50-57; col. 5, lines 16-23. In particular, the multichip module shown in FIG. 8 of Foster includes a lower die 31 with centrally located bond pads, a first layer of die attach paste 33 on regions of the active surface of the lower die 31, which secures inner-lead traces 20 to the active surface of the lower die 31, tape 32 over the inner-lead traces 20, and a second layer of die attach paste 33 securing the tape 32 to the back side of another, upper semiconductor die 30. *Id.*

The combined thicknesses of the first layer of die attach paste 33, the inner-lead traces 20, the tape 32, and the second layer of die attach paste 33 may be substantially the same as the distance the lower die 31 and an upper die 30 are to be spaced apart from one another. Nonetheless, from col. 4, lines 63-67, of Foster, it is clear that bond wires 35 must be secured to the bond pads of the lower die 31 *before* the second layer of die attach paste 33 is placed over the inner-lead traces 20. Thus, these layers do not have their final, combined height, *i.e.,* the height that will space the upper die 30 substantially a predetermined distance from a surface of the lower die 31, until *after* bond wires 35 are in place.

Independent claim 1 recites a semiconductor device that includes a semiconductor die and a dielectric spacer layer that protrudes substantially a predetermined distance from a surface of a semiconductor die *before* an intermediate conductive element is secured to a bond pad of the semiconductor die. Thus, the most basic "final structure" that the Examiner would like to "find" (*see* Office Action of May 13, 2005, page 3) that falls within the scope of independent claim 1 is a semiconductor device that may lack intermediate conductive elements, but includes a dielectric pace that protrudes substantially a predetermined distance from a surface of a semiconductor die.

The predetermined distance accommodates a height of at least one intermediate conductive element between the semiconductor die and an adjacent semiconductor die.

Thus, the recitation of a dielectric spacer layer that protrudes substantially a predetermined distance from a surface of a semiconductor die *before* an intermediate conductive element is secured to a bond pad of the semiconductor die in independent claim 1 is not functional language. To repeat: the semiconductor device of independent claim 1 need not include an intermediate conductive element; moreover, the dielectric spacer layer of independent claim 1 already has its full height even when the semiconductor device does not include an intermediate conductive element secured to a bond pad of the semiconductor die from which the dielectric spacer layer protrudes.

That being stated, a *prima facie* case of obviousness has not been established against independent claim 1 because Foster does not teach or suggest each and every element of independent claim 1. In particular, if the semiconductor device of Foster includes die attach paste 33, which imparts the purported "dielectric spacer" thereof with a thickness or height that purportedly protrudes from the surface of a semiconductor device of the semiconductor device substantially a "predetermined" distance that the semiconductor device is to be spaced apart from another semiconductor device, the semiconductor device of Foster must also include bond wires 35. Col. 4, lines 63-67. More specifically, Foster does not teach or suggest that the first layer of die attach paste 33, the inner-lead traces 20, the tape 32, and the second layer of die attach paste 33, the combined thicknesses of all of which are necessary to accommodate the height of an intermediate conductive element (*e.g.*, bond wire 35), may all be in place over lower die 31 without an intermediate conductive element (*e.g.*, bond wire 35) secured to a bond pad of the lower die 31.

Therefore, under 35 U.S.C. § 103(a), the subject matter recited in independent claim 1 is allowable over that taught in Foster.

Each of claims 2-10 and 17 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 6 is additionally allowable because Foster does not teach or suggest that the predetermined distance that the multi-layered spacing elements thereof protrude from the surface

of the lower semiconductor die 31 is the same as or less than the distance the bond wires 35 protrude above the surface of the lower semiconductor die 31. Rather, the teachings of Foster are limited to a series of layers that protrude from the surface of a lower die 31 a distance that exceeds the height that a bond wire 35 protrudes from the surface of the lower die 31.

Claim 9 is further allowable since Foster lacks any teaching or suggestion that the multi-layered spacing elements thereof may include randomly arranged features.

Independent claim 19 is directed to a semiconductor device assembly that includes a first semiconductor device and a nonconfluent spacer layer. The nonconfluent spacer layer includes dielectric material secured to the active surface of the first semiconductor device. The nonconfluent spacer layer protrudes from the active surface substantially a same distance that the active surface of the first semiconductor device is to be spaced apart from a back side of a second semiconductor device, even before an intermediate conductive element is secured to any of the bond pads of the first semiconductor device.

The recitation that the nonconfluent spacer layer protrude a particular distance from the active surface of a first semiconductor device before an intermediate conductive element is secured to a bond pad of the first semiconductor device conveys to one of ordinary skill in the art that the "final structure" need not include an intermediate conductive element and, thus, that the nonconfluent spacer layer has been imparted with its full height, or thickness, even without an intermediate conductive element secured to a bond pad of the first semiconductor device.

Foster does not teach or suggest that the first layer of die attach paste 33, the inner-lead traces 20, the tape 32, and the second layer of die attach paste 33 may all be positioned over lower die 31 without an intermediate conductive element (*e.g.,* bond wire 35) secured to a bond pad of the lower die 31. Instead, Foster teaches that bond wires 35 must be in place when the second layer of die attach paste 33 is also part of the disclosed semiconductor device and, thus, without bond wires 35 in place, the purported nonconfluent spacer layer of Foster does not protrude from an active surface of a semiconductor device substantially a same distance that the active surface of the first semiconductor device is to be spaced apart from a back side of a second semiconductor device. Col. 4, lines 63-67.

As such, it is respectfully submitted that, under 35 U.S.C. § 103(a), independent claim 19 is directed to subject matter which is allowable over that described in Foster.

Claims 20-26, 33, and 42-44 are each allowable, among other reasons, for depending either directly or indirectly from claim 19, which is allowable.

Claim 26 is additionally allowable because Foster does not teach or suggest that the predetermined distance that the multi-layered spacing elements thereof protrudes from the surface of the lower semiconductor die 31 is the same as or less than the distance the bond wires 35 protrude above the surface of the lower semiconductor die 31.

Shim

Claims 1-10, 13, 17, 19-26, 32, 33, 37-39 and 42-44 are rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly anticipated by the subject matter described in U.S. Patent 6,531,784 to Shim et al. (hereinafter "Shim").

Shim teaches elongated spacer strips 50A, 50B. FIGs. 4-6; col. 4, lines 33-38. The spacer strips 50A, 50B of Shim are formed from insulative material. Col. 4, lines 50-53. Apparently, the spacer strips 50A, 50B of Shim are preformed, as the teachings of Shim are limited to attachment or mounting (*e.g.,* with adhesive) thereof to a top surface of a semiconductor die 14. Col. 4, lines 56-60; col. 5, line 19; col. 5, lines 32-37; col. 5, lines 62-66.

Spacer strips 50A, 50B do not protrude from the top surface of semiconductor die 14 substantially the same distance that semiconductor die 14 is to be spaced apart from another semiconductor die 16. Rather, as shown in FIGS. 3, 7, 8, and 9 of Shim, once bond wires are secured to the bond pads of semiconductor die 14 and to corresponding terminals of a substrate upon which semiconductor die 12 is positioned, an additional adhesive 44 (*see also,* col. 5, lines 10-14) or spacer strip 50C (*see also,* col. 6, lines 6-19) is required to space the second semiconductor die 16 the predetermined distance apart from the active surface of the first semiconductor die 14.

Shim includes no teaching or suggestion of a semiconductor device that includes a dielectric spacer layer that, without intermediate conductive elements secured to bond pads of the semiconductor device, protrudes from a surface of a semiconductor die a predetermined distance

that the semiconductor die is to be spaced apart from another semiconductor die, as is required by independent claim 1. Instead, the teachings of Shim are limited to spacer strips 50A, 50B that protrude from the surface of a semiconductor die 14 only a portion of the distance the semiconductor die 14 is to be spaced apart from another semiconductor die 16.

Therefore, Shim does not support a *prima facie* case of obviousness against independent claim 1, as would be required to maintain the 35 U.S.C. § 103(a) rejection of independent claim 1.

Claims 2-10, 13, and 17 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 6 is additionally allowable because Shim does not teach of suggest that the predetermined distance that the spacer strips 50A, 50B thereof protrudes from the surface of the lower semiconductor die 14 is the same as or less than the distance the bond wires or other intermediate conductive elements protrude above the surface of the lower semiconductor die 14.

Claim 9 is further allowable since Shim lacks any teaching or suggestion that the spacer strips 50A, 50B thereof may include randomly arranged features.

With respect to the subject matter recited in independent claim 19, Shim lacks any teaching or suggestion of a semiconductor device assembly that may lack intermediate conductive elements but includes a first semiconductor device with a nonconfluent spacer layer protruding from an active surface thereof substantially a predetermined distance the active surface is to be spaced apart from a back side of the second semiconductor device. Rather, the teachings of Shim are limited to semiconductor devices with spacers that only have their full heights, which are equal to the distances that semiconductor dice 14 and 16 are spaced apart from one another, if the semiconductor devices also include intermediate conductive elements secured to the bond pads of the lower semiconductor die 14.

Therefore, under 35 U.S.C. § 103(a), independent claim 19 is directed to subject matter which is allowable over the subject matter described in Shim.

Each of claims 20-26, 32, 33, 37-39, and 42-44 is allowable, among other reasons, for depending either directly or indirectly from claim 19, which is allowable.

Claim 26 is additionally allowable because Shim neither teaches nor suggests that the predetermined distance that the spacer strips 50A, 50B thereof protrudes from the surface of the lower semiconductor die 14 is the same as or less than the distance that bond wires or other intermediate conductive elements protrude above the surface of the lower semiconductor die 14.

Shim in View of Smith

Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) for being drawn to subject matter which is assertedly unpatentable over the teachings of Shim, in view of teachings from U.S. Patent 6,049,370 to Smith, Jr., et al. (hereinafter "Smith").

Claims 11 and 12 are allowable, among other reasons, for depending from claim 1, which is allowable.

Shim in View of Blanton

Claims 18 and 31 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is purportedly unpatentable over the subject matter taught in Shim, in view of the teachings of U.S. Patent 5,220,200 to Blanton (hereinafter "Blanton").

Claim 18 is allowable, among other reasons, for depending from claim 1, which is allowable.

Claim 31 is allowable, among other reasons, for depending from claim 19, which is allowable.

Foster in View of Mueller

Claims 11, 13 and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,552,416 to Foster in view of U.S. Patent 6,316,786 to Mueller et al. Applicant respectfully traverse this rejection, as hereinafter set forth.

Claims 11 and 13 are both allowable, among other reasons, for depending directly from claim 1, which is allowable.

Claim 32 is allowable, among other reasons, for depending directly from claim 19, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1-13, 17-26, 31-33, 37-39, and 42-44 be withdrawn.

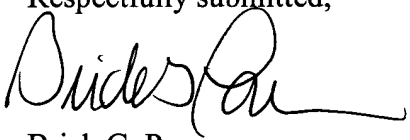
ELECTION OF SPECIES REQUIREMENT

Independent claim 1 remains generic to all of the species of invention that were identified in the Election of Species Requirement in the above-referenced application. In view of the allowability of these claims, claims 14-16, 27-30, 34-36, 41, and 45-67, which have been withdrawn from consideration, should also be considered and allowed. M.P.E.P. § 806.04(d).

CONCLUSION

It is respectfully submitted that each of claims 1-39 and 41-67 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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Date: August 8, 2005

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